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STATION NOTES

CENTRAL STATES FOREST EXPERIMENT STATION
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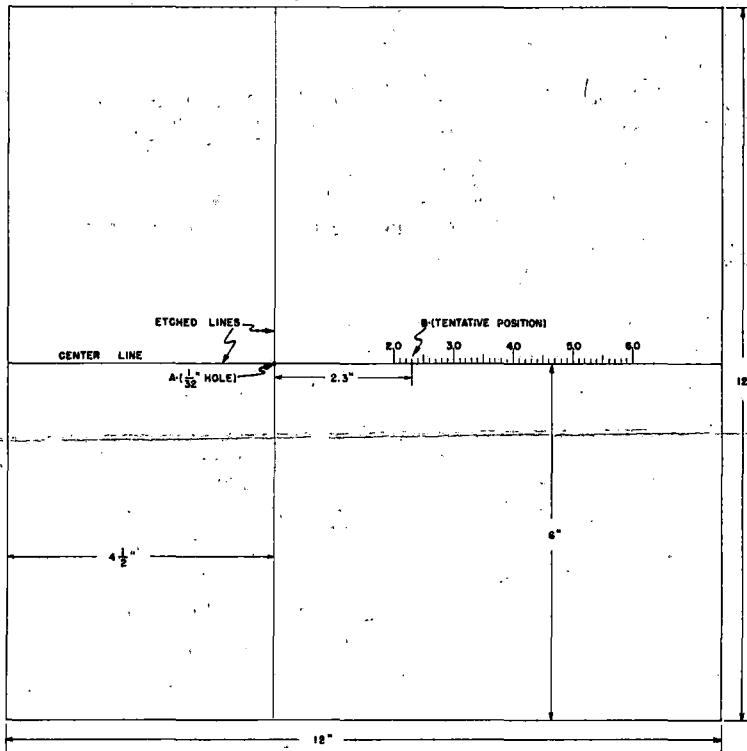
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AERIAL PHOTO ALIGNMENT GUIDE

Foresters who use aerial photographs will be interested in a mechanical aid that helps to locate photo centers and to align photos of stereo pairs. Photo interpreters who determine tree heights or differences in elevation on aerial photographs by means of the Harvard parallax wedge must have the photos of each stereo pair exactly oriented, and with the centers an exact distance apart. Also, beginners in the stereoscopic use of aerial photographs often have difficulty in placing the photos of a stereo pair in such a position that optimum stereo vision results. The aerial photo alignment guide has been developed to assist the photo interpreter in properly orienting the stereo pair for measurements with the Harvard parallax wedge and to help the beginner orient photos for stereoscopic vision.

Construction.--The construction of the photo alignment guide is a simple process. The only material needed is a 12- by 12-inch sheet of clear plastic

1/16-inch thick. Using a sharp instrument, such as a heavy needle, etch a center line across the under side of the sheet (see fig.). Next, etch a line perpendicular to the first, 4 1/2 inches from one edge. At intersection A make a hole approximately 1/32 inch in diameter. This can be made by using a drill or by forcing a heated needle through the plastic.



To complete the alignment guide for use with the Harvard parallax wedge, etch a scale along the center line, beginning at a point 2 inches from A and continuing to a point 6 inches from A. Graduate the scale in tenths of inches. This scale provides an efficient means of placing photos of a stereo pair the required distance apart. This distance will be equal to the

average distance between the two divergent lines on the parallax wedge to be used. This scale also enables the interpreter to determine the air-base distance, which is the distance between the two photo centers as shown on either photo. The air-base distance is needed when determining differences in elevation or height of trees.

To complete the alignment guide for beginners' use as an aid in placing the photos of a stereo pair in position for best stereo vision, mark in pencil on the center line the tentative position of point B. An average distance of 2.3 inches between points A and B serves for most people. A procedure for further adjusting for individual eye-differences of beginners is explained in the next section.

Use.--A few simple steps to aid in the use of the alignment guide with the parallax wedge are:

1. To find the principal point (center) of any photo, place the alignment guide over it so that the two lines of the guide fall exactly on the points of the fiducial marks (four arrows) found on the photo edge. The principal point will be beneath intersection A.
2. Mark the principal point of each photo of a stereo pair by pricking with a needle through the hole at A.
3. Next, mark the conjugate principal point on each photo. The conjugate principal point is the position of the principal point of one photo as it falls on the adjacent photos. For accurate work use the stereoscope in transferring these points.
4. Place the first photo in a fixed position on the table with a piece of tape.
5. Adjust the alignment guide over this photo until point A falls over the principal point and the center line of the guide passes over the conjugate principal point.
6. Hold the alignment guide firmly in position with the left hand and with the other slip the second photo between the guide and the first photo until the conjugate principal point on the second photo rests at the distance from A required by the size of parallax wedge being used.
7. With the second photo in this position rotate it around its conjugate principal point until the center line of the guide passes over the principal point of the second photo.
8. Fix the second photo in this position with a piece of tape. The photo centers are now properly spaced and properly oriented for making measurements with the parallax wedge.

Further adjustment of the guide to meet individual eye-differences of beginners is accomplished by finding the ultimate position of the tentative point B. To make this adjustment, proceed as in the above paragraph through step number five. As above, hold the alignment guide firmly in position over the first photo and slip the second photo between the guide and the first. Adjust the second photo until the tentative point B, previously marked on the center line of the guide, is over the conjugate principal point on the second photo. Rotate the second photo around this point until the center line of the guide passes over the principal point on the second photo. Next, place the stereoscope over the guide and while looking through them and maintaining the orientation of the second photo, move it left or right until the photos give the best stereo vision. Mark on the guide the position of the conjugate principal point of the second photo and label it ultimate point B.

To use the alignment guide to set up photos of a stereo pair for optimum stereo vision, proceed as in the eight directions given above, except that in step six, place the conjugate principal point of the second photo under ultimate point B.

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